ORDER NO. HAD85062570A8

Service Manual

Turntable System

SL-DD3

Direct Drive
Automatic Turntable

Color

(S)...Silver Type
(K)...Black Type

Color	Areas
(S) (K)	[E] ...Switzerland and Scandinavia.
(S) (K)	[EK]...United Kingdom.
(S) (K)	[XL]...Australia.
(S) (K)	[EG]...F.R. Germany.
(S) (K)	[EB]...Belgium.
(S) (K)	[EH]...Holland.
(S) (K)	[EF]...France.
(S) (K)	[Ei] ...Italy.
(S) (K)	[EC]...Czechoslovakia.
(S) (K)	[XA]...Southeast Asia, Oceania, Africa, Middle Near East and Central South America.

T4P is the standard mark for plug-in-connector type. Products carrying this mark are interchangeable and adaptable among each other.

Please use this manual together with the service manual for Model No. SL–D93U[M], Order No. HAD85042530C1.

SPECIFICATIONS

■ Turntable section

Type: Direct drive
Automatic turntable
Auto start
Auto return
Auto stop
Manual play

Drive method: Direct drive

Motor: Brushless DC motor

Turntable platter: Aluminum die-cast
Diameter 31.2 cm

Turntable speeds: 33-1/3 rpm and 45 rpm

Wow and flutter: 0.012% WRMS*
0.025% WRMS (JIS C5521)
±0.035% peak
(IEC 98A Weighted)

*This rating refers to turntable assembly alone, excluding effects of record, cartridge or tonearm, but including platter. Measured by obtaining signal from built-in frequency generator of motor assembly.

Rumble: −56 dB (IEC 98A Unweighted)
−78 dB (IEC 98A Weighted)

■ Tonearm section

Type: Statically balanced straight tonearm
Plug-in connector cartridge system

Effective length: 230 mm

Overhang: 15 mm

Tracking error angle: Within 2°32′ at the outer groove of 30 cm record
Within 0°32′ at the inner groove of 30 cm record

Effective mass: 13.5 g (including cartridge)

Stylus pressure: 1.25 g (Fixed)

Applicable cartridge weight: 6 g

Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

SL-DD3

■ Cartridge section

Type:	Moving magnet stereo cartridge
Magnet circuit:	All laminated core
Frequency response:	10 Hz~35 kHz
Output voltage:	2.5 mv at 1 kHz, 5 cm/s. zero to peak lateral velocity (7 mV at 1 kHz, 10 cm/s. zero to peak 45° velocity [DIN 45 500]
Channel separation:	22 dB at 1 kHz
Channel balance:	Within 2 dB at 1 kHz
Recommended load impedance:	47 kΩ~100 kΩ
Compliance (dynamic):	12×10^{-6} cm/dyne at 100 Hz
Stylus pressure range:	1.25±0.25 g (12.5±2.5 mN)
Weight:	6 g (cartridge only)
Replacement stylus:	EPS-30CS

■ General

Power supply:	For Continental Europe: AC 220V, 50Hz For United Kingdom and Australia: AC 240V, 50Hz For others: ~110—127/220—240V, 50/60Hz
Power consumption:	4W
Dimensions: (W×H×D)	43×10×37.5 cm Maximum height when dust cover is open. 43×37×41 cm
Weight:	4.5 kg

Specifications are subject to change without notice for further improvement.

TECHNISCHE DATEN

■ Plattenspieler

Typ:	Direktantrieb Automatischer Plattenspieler Startautomatik Rückführautomatik Stopautomatik Manueller Betrieb
Antrieb:	Direktantrieb
Motor:	Kollektorloser Gleichstrommotor
Plattenteller:	Aluminium-Spritzguß Durchmesser 31,2 cm
Plattenteller-Drehzahlen:	33-1/3 und 45 U./min.
Gleichlaufschwankungen:	0,012% WRMS* 0,025% WRMS (JIS C5521) ±0,035% Spitze (IEC 98A bewertet)

*Diese Nennleistung bezieht sich auf den laufwerkteil allein, ausschließlich Einflüsse von Schallplatte, Tonabnehmer oder Tonarm, aber einschließlich Plattenteller, Gemessen anhand von Signalen vom eingebauten Frequenzgenerator des Motorteils.

Rumpeln:	−56 dB (IEC 98A unbewertet) −78 dB (IEC 98A bewertet)

■ Tonarm

Typ:	Statisch balancierter, gerader Tonarm Tonabnehmersystem vom Einsteck-Typ
Effektive Länge:	230 mm
Überhang:	15 mm
Spurfehlwinkel:	2°32' bei der Einlaufrille einer 30 cm-Plate 0°32' bei der Auslaufrille einer 30 cm-Plate
Effektive Masse:	13,5 g (einschließlich Tonabnehmer)
Nadeldruck-Einstellbereich:	1,25 g (nicht einstellbar)
Zulässiges Tonabnehmer-gewicht:	6 g

■ Tonabnehmer

Typ:	Beweglicher Magnet-Stereo-Tonabnehmer
Magnetkreis:	Ganzlamellenkern
Frequenzgang:	10 Hz bis 35 kHz
Ausgangsspannung:	2,5 mV bei 1 kHz 5 cm/s. Null-zu-Spitze, lateral [7 mV bei 1 kHz 10 cm/s. Null-zu-Spitze, 45° (DIN 45 500)]
Kanaltrennung:	22 dB bei 1 kHz
Kanalabweichung:	Innerhalb 2 dB bei 1 kHz
Empfohlene Endimpedanz:	47 kΩ~100 kΩ
Nachgiebigkeit (dynamisch):	12×10^{-6}cm/dyn bei 100 Hz
Nadeldruck bereich:	1,25±0,25 g (12,5±2,5 mN)
Gewicht:	6 g (nur Tonabnehmer)
Ersatznadel:	EPS-30CS

■ Allgemeine Daten

Stromversorgung:	220 V, 50 Hz
Leistungsaufnahme:	4 W
Abmessungen: (B×H×T)	43×10×37,5 cm Maximale Höhe bei geöffnetem Oberteil (Staubebdeckung) 43×37×41 cm
Gewicht:	4,5 kg

Die technischen Daten Können infolge von Verbesserungen ohne Ankündigung geändert werden.

CARACTERISTIQUES

■ Platine de lecture

Type: Entraînement direct
Platine automatique
Démarrage automatique
Retour automatique
Arrêt automatique
Audition à commande manuelle

Système d'entraînement: Entraînement direct
Moteur: Moteur à C.C. sans balai
Plateau de lecture: En aluminium moulé sous pression
Diamètre 31,2 cm
Vitesses de rotation: 33-1/3 et 45 t/p.m.
Pleurage et scintillement: 0,012% de valeur efficace*
0,025% de valeur efficace (JIS C5521)
±0,035% de crête (IEC 98A Pondéré)

* Ce régime nominal se rapporte à l'ensemble du tourne-disque seul, excluant les effets du disque, de la cellule pick-up ou du bras de lecture, mais comprenant le plateau. Mesuré par l'obtention d'un signal provenant du générateur de fréquences incorporé de l'ensemble du moteur.

Ronflement: −56 dB (IEC 98A Non pondéré)
−78 dB (IEC 98A Pondéré)

■ Bras de lecture

Type: Bras de lecture rectiligne statiquement équilibré.
Système de cellule de lecture à connecteur enfichable.
Longueur effective: 230 mm
Porte-à-faux: 15 mm
Angle d'erreur de piste: En deçà de 2°32' au sillon extérieur d'un disque de 30 cm
En deçà de 0°32' au sillon intérieur d'un disque de 30 cm
Masse réelle: 13,5 g (y compris la cellule pick-up)
Plage de réglage de la pression d'appui: 1,25 g (Fixé)
Poids des cellules pick-up utilisables: 6 g

■ Cellule pick-up

Type: Cellule pick-up stéréo à aimant mobile
Circuit magnétique: Noyau entièrement feuilleté
Réponse en fréquence: 10 Hz à 35 kHz
Tension de sortie: 2,5 mV à 1 kHz; 5 cm/s., zéro à vitesse latérale de crête
(7 mV à 1 kHz, 10 cm/s., zéro à vitesse 45° de crête [DIN 45 500])
Séparation des canaux: 22 dB à 1 kHz
Equilibrage des canaux: En deçà de 2 dB à 1 kHz
Impédance de charge recommandée: 47 kΩ ~ 100 kΩ
Elasticité (dynamique): 12×10^{-6} cm/dyne à 100 Hz
Plage de la force verticale d'appui: 1,25±0,25 g (12,5±2,5 mN)
Poids: 6 g (cellule seule)
Pointe de lecture de remplacement: EPC-30CS

■ Généralités

Alimentation: 220 V, 50 Hz
Consommation: 4 W
Dimensions: (L×H×P) 43×10×37,5 cm
Hauteur maximum lorsque le couvercle protège-poussière est ouvert:
43×37×41 cm
Poids: 4,5 kg

Sujet à changement sans préaris.

ESPECIFICACIONES

■ Sección del plato giratorio

Tipo: Plato giratorio automático con accionamiento directo
Arranque automático
Retorno automático
Parada automática
Ejecución manual
Método de accionamiento: Accionamiento directo
Motor: Motor de corriente continua sin escobillas
Platillo del plato giratorio: Aluminio fundido
Diámetro 31,2 cm
Velocidades del plato giratorio: 33-1/3 y 45 rpm
Ululaciones y trémolo: 0,012% WRMS*
0,025% WRMS (JIS C5521)
±0,035% cresta (IEC 98A Ponderado)

*Estas caracteristicas se refieren únicamente al conjunto del plato giratorio, con exclusión de los efectos provenientes del disco, cartucho o del brazo sonoro, incluyendo, empero, el platillo. La medida fue tomada por medio de la señal obtenida del generador de frecuencias incorporado del conjunto del motor.

Ruido de rodadura: −56 dB (IEC 98A No ponderado)
−78 dB (IEC 98A Ponderado)

■ Sección del brazo sonoro

Tipo: Brazo sonoro recto con equilibrio estático
Sistema de cartucho con conector enchufable
Longitud efectiva: 230 mm
Proyección: 15 mm
Angulo de error de seguimiento: Inferior a 2°32' en el surco exterior de un disco de 30 cm
Inferior a 0°32' en el surco interior de un disco de 30 cm
Masa efectiva: 13,5 g (incluyendo el cartucho)
Presión de la aguja: 1,25 g (Fija)
Preso de cartucho utilizable: 6 g

■ Sección del cartucho

Tipo: Cartucho estereofónico de imán móvil
Circuito magnético: Núcleo totalmente laminado
Respuesta de frecuencia: 10 Hz a 35 kHz
Voltaje de salida: 2,5 mV a 1 kHz
Con velocidad lateral de cero a cresta de 5 cm/s
[7 mV a 1 kHz Velocidad de 45° de cero a cresta de 10 cm/s (DIN 45 500)]
Separación de canales: 22 dB a 1 kHz
Equilibrio de canales: Sin exceder 2 dB a 1 kHz
Impedancia de carga recomendada: 47 kΩ a 100 kΩ
Elasticidad (dinámica): 12×10^{-6}cm/dina a 100 Hz
Radio de presión de la aguja: 1,25±0,25 g (12,5±2,5 mN)
Peso: 6 g (cartucho sólo)
Aguja de recambio: EPS-30CS

■ En general

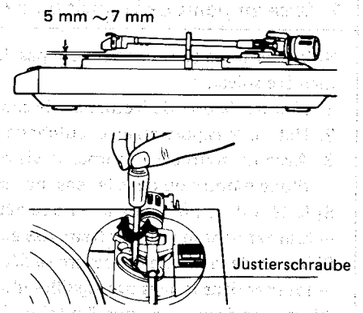
Alimentación de corriente: ~110–127/220–240V, 50 ó 60 Hz
Consumo de corriente: 4 W
Dimensiones: (Ancho×Alto×Prof.) 43×10×37,5 cm
Altura máxima cuando la tapa contra el polvo está abierta.
43×37×41 cm
Peso: 4,5 kg

Estas especificaciones están sujetas a cualquier cambio sin previo aviso.

■ MESSUNGEN UND JUSTIERUNGEN — Deutsch

1. Justierung der Tonamlifthöhe

Die Tonarmilifthöhe, d.h. der Abstand zwischen Nadelspitze und Schallplattenoberfläche bei Liftsteuerungs-Position " ▼ ", wurde werkseitig auf ca. 5 ~ 7 mm eingestellt.
Falls der Abstand zu groß oder zu klein ist (z.B. wegen unterschiedlicher Tonabnehmergröße), drehen Sie die Justierschraube im Uhrzeigersinn oder entgegen dem Uhrzeigersinn.
Drehung im Uhrzeigersinn
– Der Abstand zwischen der Platte und der Nadelspitze wird kleiner.
Drehung entgegen dem Uhrzeigersinn
– Der Abstand zwischen der Platte und der Nadelspitze wird größer.

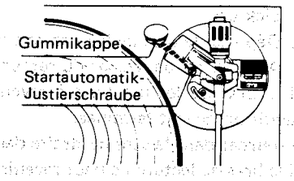


2. Justierung des Aufsetzpunktes der Automatik

Wenn der Tonarm in der Nähe der Plattenmitte ist, so ist die Auto-Rückkehr-Justierschraube sichtbar.

Wenn die Abtastnadel nicht in der Einlaufrille aufsetzt, justieren Sie wie folgt.
1. Befestigen Sie den Tonarm mit der Arretierklammer auf der Tonarmablage.
2. Nehmen Sie die Gummikappe von der Auto-Start-Positions-Justierschraube ab.
3. Drehen Sie die Justierschraube im Uhrzeigersinn oder entgegen dem Uhrzeigersinn, wie erforderlich.

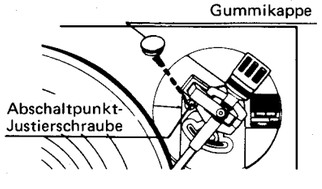
Falls der Aufsetzpunkt im Wiedergabeteil der Schallplatte liegt.
– Entgegen dem Uhrzeigersinn drehen.
Falls der Aufsetzpunkt außerhalb der Platte liegt.
– Im Uhrzeigersinn drehen.
Justieren Sie so, daß die Nadelspitze 1 – 2 mm vom Rand entfent auf der Platte aufsetzt.



3. Justierund des Abschaltpunktes der Automatik

(Die Gummikappe abnehmen)
1. Setzen Sie den Nadelschutz auf den Tonabnehmer auf.
2. Führen Sie den Tonarm gegen die Plattenmitte.
   Die Justierschraube für den Abschaltpunkt der Automatik wird dann sichtbar.

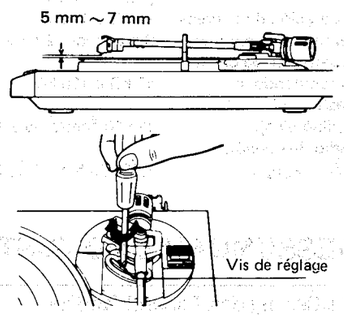
Falls der Tonarm zu früh zurückkehrt.
– Entgegen dem Uhrzeigersinn drehen.
Falls der Tonarm nach Erreichen der Auslaufrille nicht zurückkehrt.
– Im Uhrzeigersinn drehen.



■ MESURAGES ET RÉGLAGES — Français

1. Mise au point de la hauteur de l'élévateur du bras

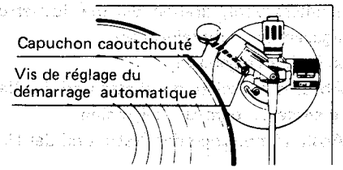
La hauteur de l'élévateur du bras (distance entre l'extrémité de la pointe de lecture et la surface du disque, lorsque la commande de pose et de relevage est à la position " ▼ ") à été réglée en usine sur approximativement 5 à 7 mm.
Si l'écartement est trop étroit ou trop large, tourner la vis de réglage dans le sens des aiguilles d'une montre ou dans le sens contraire.
Rotation dans le sens des aiguilles d'une montre.
– La distance entre la surface du disque et l'extrémité de la pointe de lecture diminue.
Rotation dans le sens contraire des aiguilles d'une montre.
– La distance entre la surface du disque et l'extrémité de la pointe de lecture augmente.



2. Mise au point de la position de démarrage automatique

Si la pointe de lecture ne repose pas dans le sillon d'entrée, ajuster de la manière suivante.
1. Bloquer le bras de lecture sur le support du bras.
2. Retirer le capuchon en caoutchouc.
3. Avec un tournevis, tourner la vis de réglage dans le sens des aiguilles d'une montre ou dans le sens inverse selon la nécessité.

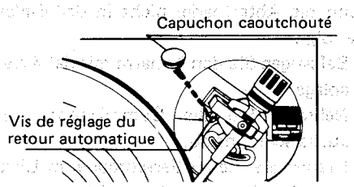
Si la tête de la pointe de lecture se dépose trop loin du sillon enregistré,
– tourner dans le sens contraire des aiguilles d'ue montre.
Si la tête de la pointe de lecture se dépose en dehors du disque,
– tourner dans le sens des aiguilles d'une montre.
Ajuster de façon à ce que l'extrémité de la pointe de lecture atterrisse à 1 – 2 mm à partir du bord du disque.



3. Mise au point de la position de retour automatique

(Retirer le tapis du plateau de lecture.)
1. Placer le capot protecteur de la pointe de lecture sur la cellule pick-up.
2. Déplacer le bras de lecture vers le centre du disque.
   Alors, la vis de réglage du retour automatique apparaîtra.

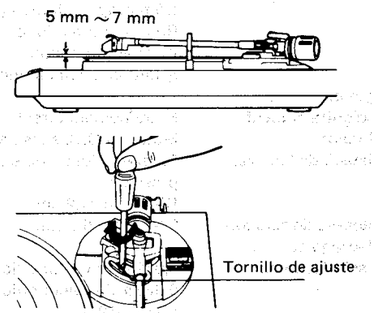
Si le bras de lecture tend à revenir vers le support du bras avant que l'audition ne soit terminée.
– tourner dans le sens contraire des aiguilles d'une montre.
Si le bras de lecture ne peut revenir en arrière après le dernier sillon.
– tourner dans le sens des aiguilles d'une montre.



■ MEDICIONES Y AJUSTE — Español

1. Ajuste de la altura de èlevación del brazo

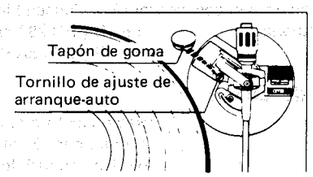
La altura de elevación del brazo (o sea, la distancia entre la punta de la aguja y la superficie del disco cuando el control de colocación esté en la posición " ▼ ") has sido regulada en la fábrica aproximadamente entre 5 y 7 mm.
En caso que la distancia fuese demasiado abundante o demasiado escasa, girar el tornillo de ajuste hacia la derecha o hacia la izquierda.
Rotación hacia la derecha
– reduce la distancia entre el disco y la punta de la aguja.
Rotación hacia la izquierda
– aumenta la distancia entre el disco y la punta de la aguja.



2. Ajuste de la posición para el arranaue automático

En caso que la aguja no se depositara en el surco de comienzo, regular de la manera que sigue.
1. Sujetar el brazo sonoro al apoyo del mismo con la grapa.
2. Quitar la tapita de goma.
3. Girar el tornillito de ajuste hacia la derecha o hacia la izquierda usando un destornillador, según sea necesario.

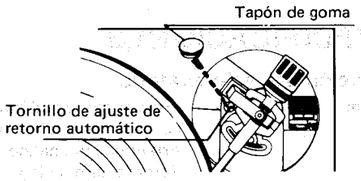
En caso que la punta de la aguja se deposita muy dentro del surco grabado:
– Girar hacia la izquierda.
En caso que la punta de la aguja se deposita fuera del disco:
– Girar hacia la derecha.
Regular de manera tel que la punta de la aguja se deposite a uno o dos milímetros del borde del disco.



3. Ajuste de la posición para retorno automatico

(Quitar la almohadilla del plato giratorio.)
1. Colocar la protección de la aguja en el cartucho.
2. Mover el brazo sonoro hacia el centro del disco.
   Con ello, aparecerá el tonillo de ajuste del retorno automático.

Cuando el brazo sonoro tienda a volver a su apoyo antes de terminar la ejecución.
– Girar hacia la izquierda.
En caso que el brazo sonoro no vuelva después de haber tocado el último surco del disco.
– Girar hacia la derecha.



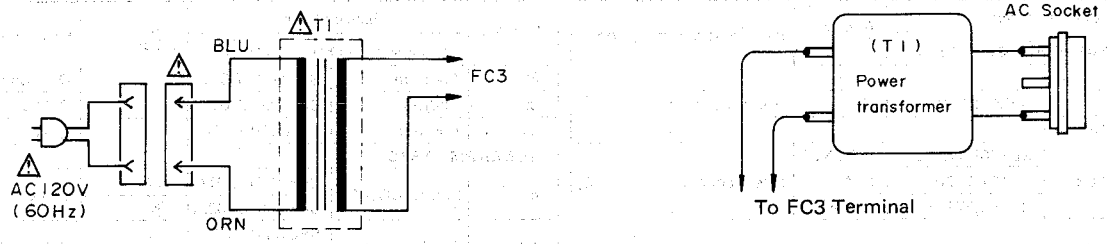
■ SCHEMATIC DIAGRAM AND PRINTED CIRCUIT BOARD

Important safety notice:

Components identified by ⚠ mark have special characteristics important for safety.
When replacing any of these components use only manufacturer's specified parts.

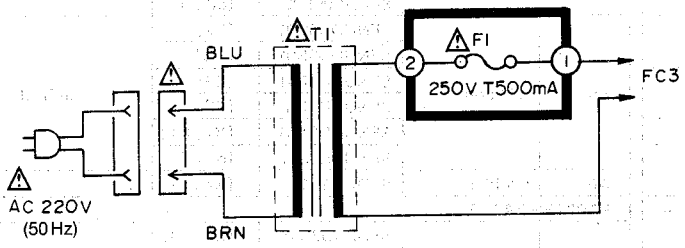
- **Change in power source circuit**

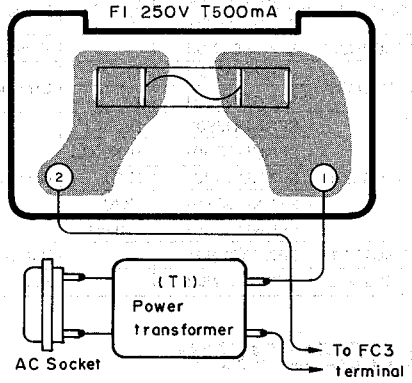
Product for U.S.A. ([M] area)



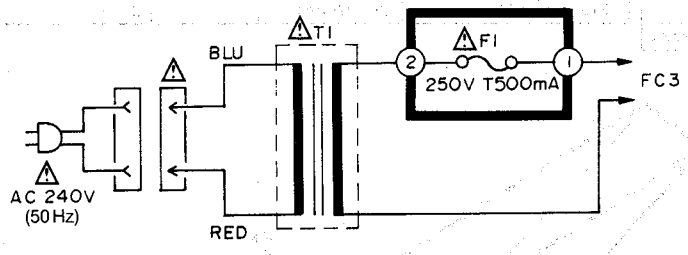
Change

Product for Continental Europe ([E], [EG], [EB], [EH], [EF], [Ei] and [EC] areas.)

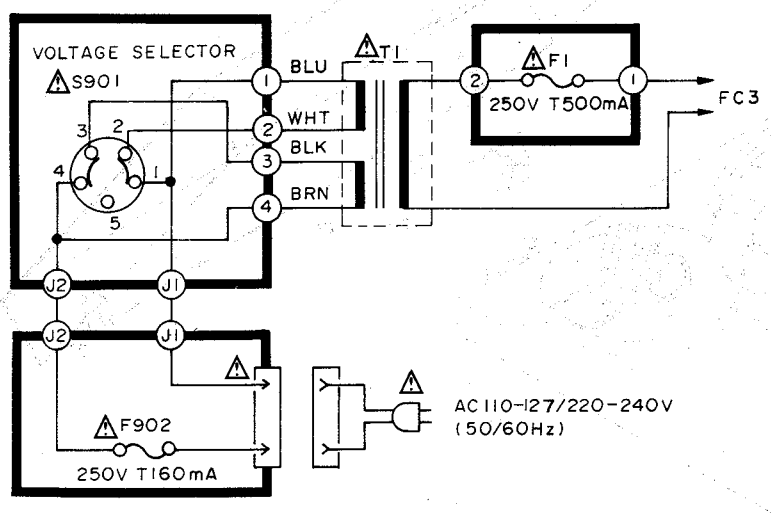


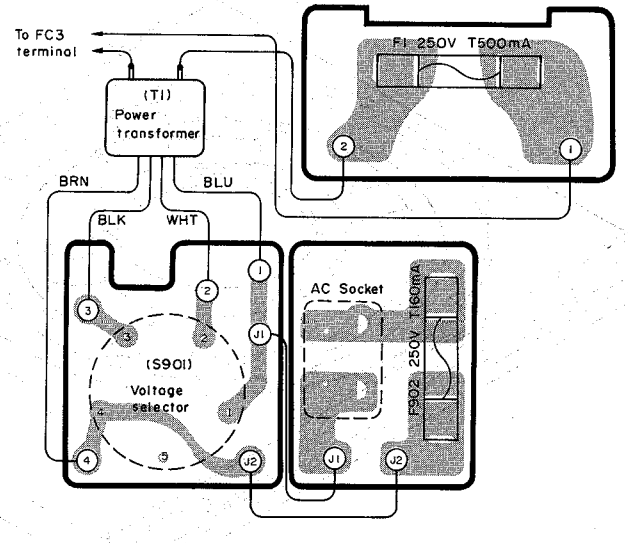


Product for United Kingdom and Australia ([EK] and [XL] areas)



Product for Southeast Asia, Oceania, Africa, Middle Near East and Central South America. ([XA] area)





■ CHANGE IN REPLACEMENT PARTS LIST

Notes:

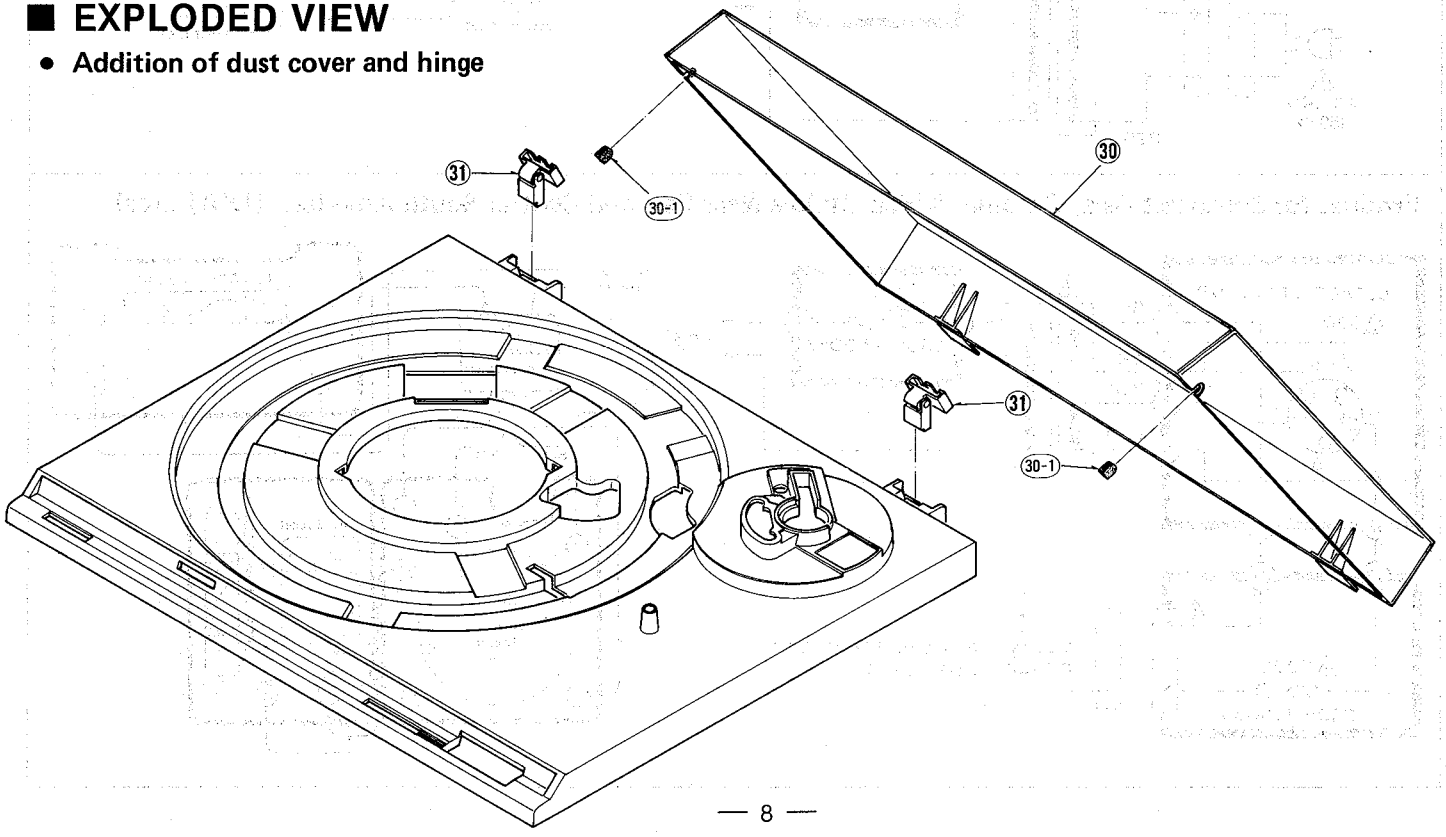
1. Mentioned in this parts list are only those changed in Model No. SL-D93U for destination [M] area.
2. Important safety notice:
   Components identified by ⚠ mark have special characteristics important for safety.
   When replacing any of these components, use only manufacturer's specified parts.
3. Ⓚ-marked parts are used for black only, while ○-marked parts are for silver type only.
4. Part other than Ⓚ -and ○-marked are used for both black and silver type.
5. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.

Ref. No.	Change of Part SL–D93U → SL–DD3		Area & Color	Part Name & Description
SWITCH				
S901	Addition	SFDSHXW225–3	[XA] only	Voltage Selector ⚠
POWER TRANSFORMERS				
T1	SLT48DTL3A	SLT48DTE13E	[EK, XL]	Power Source ⚠
		SLT57DT7E	[XA]	
		SLT48DT10E	[other]	
FUSES				
F1	Addition	XBA2C05TR0		250V, T500mA ⚠
F902	Addition	XBA2C016TR0	[XA] only	250V, T160mA ⚠
CABINET and CHASSIS PARTS				
8	SFGCC05N02	SFGCC05X01	[XA]	Rubber Cushion
		SFGCC05N02	[other]	
10	SFDJHSC0491	SFDJHSC0491	[XL]	AC Socket ⚠
		SFDJHSC04912	[XA]	
		SFDJHSC0516	[other]	
11	SFACDD3N21E	SFACDD3N01E	○	Cabinet
		SFACCD3N21E	Ⓚ	
11–1	SFKBBD2N21	SFKBBD2N01	○	Badge
		SFKBBD2N21	Ⓚ	
12	SFKTBD2N23	SFKTBD2N03		Knob, Speed Selector
13	SFKKD93M01	SFKKDD3N01	○	Ornament Plate
		SFKKDD3N21	Ⓚ	
15	SFNND94M01	SFNNDD3S01	[E, EC]	Name Plate
		SFNNDD3G01	[EK, XL]	
		SFNNDD3R01	[EG]	
		SFNNDD3X01	[XA]	
		SFNNDD3Q01	[other]	
16	SFKTBD2N21	SFKTBD2N01		Button, Start/Stop
19	SFKTBD2N22	SFKTBD2N02		Button, Cueing and Repeat

Ref. No.	Change of Part SL–D93U → SL–DD3		Area & Color	Part Name & Description
30	Addition	SFADZ15R01E		Dust Cover
30–1	Addition	SFGZD04N01		Rubber Cushion
31	Addition	SFATZ15R01E		Hinge
TONEARM PARTS				
41	SFPAMDD202A	SFPAMDD201A	○	Tonearm
		SFPAMDD202A	Ⓚ	
43	SFGK171F01	SFGK170–01	○	Rubber Cup
		SFGK171F01	Ⓚ	
54	EPC–P33S	PEC–P30S		★ Cartridge
55	EPS–33CS	EPS–30CS		★ Stylus
ACCESSORIES				
A3	SFDAC05M02	SFDAC05G02	[EK]	AC Cord ⚠
		SFDAC05L01	[XL]	
		SFDAC05X02	[XA]	
		SFDAC05E02	[other]	
A5	Addition	SFNUDD3G01	[EK]	Instruction Book
		SFNUDD3R01	[EG]	
		SFNUDD3F01	[EF]	
		SFNUDD3I01	[Ei]	
		SFNUDD3X01	[XL, XA]	
		SFNUDD3S01	[other]	
A6	Addition	SFDKI19118	[XA] only	Plug ⚠
PACKING PARTS				
P1	SFHPD94M01	SFHPDD3C01	[EF] ○	Carton Box
		SFHPDD3M01	[other] ○	
		SFHPDD3F21	[EF] Ⓚ	
		SFHPDD3M21	[other] Ⓚ	
P13	Addition	SFYP75A41		Sheet

■ EXPLODED VIEW

- **Addition of dust cover and hinge**



■ REPLACEMENT PARTS LIST

Notes:

1. Part numbers are indicated on most mechanical parts. Please use this part number for parts order.
2. Important safety notice:
   Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
3. Ⓚ -marked parts are used for black only, while ○-marked parts are for silver type only.
4. Part other than Ⓚ -and ○-marked are used for both black and silver type.
5. Bracketed indications in Ref. No. columns specify the area.
   Parts without these indications can be used for all areas.
6. The "Ⓢ" mark is service standard parts and may differ from production parts.
7. The parenthesized numbers in the column of description stand for the quantity per set.

Color	Areas
(S) (K)	[E] ...Switzerland and Scandinavia.
(S) (K)	[EK]...United Kingdom.
(S) (K)	[XL] ...Australia.
(S) (K)	[EG]...F.R. Germany.
(S) (K)	[EB]...Belgium.
(S) (K)	[EH]...Holland.
(S) (K)	[EF]...France.
(S) (K)	[Ei] ...Italy.
(S) (K)	[EC]...Czechoslovakia.
(S) (K)	[XA]...Southeast Asia, Oceania, Africa, Middle Near East and Central South America.

Ref. No.		Part No.	Description
INTEGRATED CIRCUITS			
IC1		AN78N12	Regulator
IC101		AN6639	Turntable Drive
DIODES			
D1~4	⚠	SVD1SR35200V	Rectifier
D101		MA1075−FV	7.5V, Zener
SWITCHES			
S1	⚠	SFDSD72R01	Power
S2	⚠	SFDSHSW0949	Speed Selector
S901 [XA] only	⚠	SFDSHXW225−3	Voltage Selector
HALL ELEMENTS			
H101, 102		0H−002	Turntable Position Detector
POWER TRANSFORMER			
T1 [EK, XL]	⚠	SLT48DTE13E	Power Source
T1 [XA]	⚠	SLT57DT7E	Power Source
T1 [other]	⚠	SLT48DT10E	Power Source
OSCILLATOR			
X101		SVFCSB525P	525kHz Ceramic Oscillator
FUSES			
F1	⚠	XBA2C05TR0	250V, T500mA
F902 [XA] only	⚠	XBA2C016TR0	250V, T160mA

Ref. No.	Part No.	Description
RESISTORS		
R101	ERD10TLJ101U	Chip Carbon, 1/8W, 100Ω, ±5%
R102	ERX1ANJ1R8	Metal Film, 1W, 1.8Ω, ±5%
R103	ERD10TLJ822U	Chip Carbon, 1/8W, 8.2KΩ, ±5%
R104	ERD10TLJ150U	Chip Carbon, 1/8W, 15Ω, ±5%
R105	ERD10TLJ101U	Chip Carbon, 1/8W, 100Ω, ±5%

Ref. No.	Part No.	Description
CAPACITORS		
C1, 2, 3⚠	ECQG1223KZ	Polyester, 100V, 0.022μF, ±10%
C4	ECEB1VU102	Electrolytic, 35V, 1000μF
C5, 6	ECFR1H104ZF	Ceramic, 50V, 0.1μF, $\pm^{80}_{20}$%
C101	ECQM1H562JV	Polyester, 50V, 0.0056μF, ±5%
C102	ECUV1H181JCM	Chip Ceramic, 50V, 180PF, ±5%
C104	ECEA1AN470SB	Non Polar Electrolytic, 10V, 47μF
C105	ECEA1AN330S	Non Polar Electrolytic, 10V, 33μF
C106	ECFR1H104ZF	Ceramic, 50V, 0.1μF, $\pm^{80}_{20}$%
C107	ECEA1CN100S	Non Polar Electrolytic, 16V, 10μF
C108	ECEA1AN330S	Non Polar Electrolytic, 10V, 33μF
C109	ECEA1CU330	Electrolytic, 16V, 33μF
C111	ECFR1H104ZF	Ceramic, 50V, 0.1μF, $\pm^{80}_{20}$%

Ref. No.		Part No.	Description	
CABINET and CHASSIS PARTS				
1		SFTGBD3N01	Turntable Mat	(1)
2		SFTEDD3N01	Turntable Platter	(1)
3		SFUMQ34N01E	Base Disc Size Sensor	(1)
4		SFUZD33−01E	Latch, Disc Size Sensor Base	(2)
5		SFTMC07−01E	Magnet	(1)
6		SFMGQ34N01	Cover, Stator Coil	(1)
7		SFMZQ63M53A	Stator Flame Ass'y	(1)
8 [XA]		SFGCC05X01	Rubber Cushion	(2)
8 [other]		SFGCC05N02	Rubber Cushion	(2)
9		SFGZC05N03	Rubber Cushion	(1)
10 [XL]	⚠	SFDJHSC0491	AC Socket	(1)
10 [XA]	⚠	SFDJHSC04912	AC Socket	(1)
10 [other]	⚠	SFDJHSC0516	AC Socket	(1)
11	○	SFACDD3N01E	Cabinet	(1)
11	Ⓚ	SFACDD3N21E	Cabinet	(1)

Ref. No.		Part No.	Description	
CABINET and CHASSIS PARTS				
11-1	○	SFKBBD2N01	Badge	(1)
11-1	Ⓚ	SFKBBD2N21	Badge	(1)
12		SFKTBD2N03	Knob, Speed Selector	(1)
13	○	SFKKDD3N01	Ornament Plate	(1)
13	Ⓚ	SFKKDD3N21	Ornament Plate	(1)
14		SFUMQD3N01	Lever, Speed Selector	(1)
15 [E, EC]		SFNNDD3S01	Name Plate	(1)
15 [EK, XL]		SFNNDD3G01	Name Plate	(1)
15 [EG]		SFNNDD3R01	Name Plate	(1)
15 [XA]		SFNNDD3X01	Name Plate	(1)
15 [other]		SFNNDD3Q01	Name Plate	(1)
16		SFKTBD2N01	Button, Start Stop	(1)
17		SFUZB63M01	Rod, Stop Button	(1)
18		SFUMBD3N01	Base, Stop Button	(1)
19		SFKTBD2N02	Button, Cueing and Repeat	(2)
20		SFQPZ15R02	Spring, Cueing and Repeat Button	(2)
21		SFUMBD3N02	Guide, Cueing and Repeat Button	(2)
22		SFUPB63M01	Lever, Repeat	(1)
23		SFUMBD2N03	Lever, Cueing	(1)
24		SFAUBD2N01	Bottom Cover	(1)
25		SFGABD2N01	Insulator	(4)
26		SFQCQD3N01	Spring, Insulator	(4)
27 [XA] only		SFDJBD2N01	Jack, Phono Output	(1)
27 [other]		SFDJBD2S01E	Jack, Phono Output	(1)
28		SFQHZ15R01	Spring, Stop Button	(1)
29		SFYB−5−32	Ball	(2)
30		SFADZ15R01E	Dust Cover	(1)
30-1		SFGZD04N01	Rubber Cushion	(2)
31		SFATZ15R01A	Hinge	(2)
TONEARM PARTS				
41	○	SFPAMDD201A	Tonearm	(1)
41	Ⓚ	SFPAMDD202A	Tonearm	(1)
42		SFKUMA1N01E	Arm Rest	(1)
43	○	SFGK170−01	Rubber Cap	(1)
43	Ⓚ	SFGK171F01	Rubber Cap	(1)

Ref. No.	Part No.	Description	
TONEARM PARTS			
44	SFKKBD2N02	Plate, Canceller	(1)
45	SFXJBD2N51	Lift Shaft	(1)
46	SFUMBD2N51	Lift Arm	(1)
47	SFUPBD3N51E	Arm Base	(1)
48	SFQAZ15R53	Spring	(1)
49	SFUPB63M52E	Fixing Plate	(1)
50	SFQHB63M57	Spring	(1)
51	SFQHB63M56	Spring	(1)
52	SFUMZ15R57	Spring Pin	(1)
53	SFGZZ15R02	Holder	(2)
54	EPC—P30S	★ Cartridge	(1)
55	EPS—30CS	★ Stylus	(1)
56	SFCNC03301	Cover, Stylus	(1)
AUTOMATIC MECHANISM PARTS			
61	SFUKB63M52E	Mechanism Plate	(1)
62	SFUBB63M51E	Drive Plate	(1)
62-1	SFUMB63M52	Repeat Plate	(1)
62-2	SFQPB63M51	Spring	(1)
62-3	SFUMB63M51	Plate	(1)
63	SFUMB63M71E	Lever Switch Ass'y	(1)
63-1	SFQHQD3N01	Spring	(1)
64	SFUMB63M53E	Cut Lever Ass'y	(1)
64-1	SFQHB63M51	Spring	(1)
65	SFUMB63M54	Lever, Drive Operation	(1)
66	SFUGB63M51E	Main Gear Ass'y	(1)
67	SFUMB63M65	Control Plate	(1)
68	SFUMB63M64E	Plate (B) Ass'y Index	(1)
69	SFUMB63M63	Plate (A), Index	(1)
70	SFQPB63M53	Spring, Index Sub Plate	(1)
71	SFUMB63M62	Sub Plate, Index	(1)
72	SFUMB63M59	Lever, Cueing	(1)
73	SFUMB63M60	Cam, Cueing	(1)
74	SFQPB63M52	Spring, Cueing Cam	(1)
75	SFQPB63M54	Spring, Cueing Cam	(1)
76	SFUMB63M61	Lever, Brake	(1)
77	SFQSB63M52	Spring, Brake	(1)

Ref. No.	Part No.	Description	
AUTOMATIC MECHANISM PARTS			
78	SFUZB63M52	Felt, Brake Lever	(1)
79	SFQHB63M55	Spring, Cueing Cam	(1)
80	SFUMB63M58	Lever, Repeat	(1)
81	SFQHB63M54	Spring, Repeat Lever	(1)
82	SFUMQ63M51E	Record Size Detector Ass'y	(1)
82-1	SFQHB63M53	Spring, Record Size Detector Ass'y	(1)
83	SFUMZ15R56	Pin	(7)
84	SFQSB63M51	Rod	(1)
SCREWS and WASHERS			
N1	XTN3+6J	Tapping, ⊕3×6	(3)
N2	XTV3+6J	Tapping, ⊕3×6	(4)
N3	XTW3+14QFYR	Tapping, ⊕3×14	(5)
N4	XTV3+8G	Tapping, ⊕3×8	(10)
N5	SFXWC06N02	Washer	(1)
N6	SFXGQ06N01	Screw	(2)
N7	XWC3B	Washer, φ3	(3)
N8	XTV3+10G	Tapping, ⊕3×10	(9)
N9	XTV3+30J	Tapping, ⊕3×30	(1)
N10	SFXGQ34N02	Screw	(1)
N11	SFXWZ15R51	Washer	(1)
N12	XUC3FY	Washer, φ3	(1)
N13	XYN3+F12	Tapping, ⊕3×12	(2)
N14	SFPEV0Q601	Screw, Cartridge	(1)
N15	XTV3+20J	Screw, ⊕3×20	(1)
N16	SFXWZ15R51	Washer	(9)
N17	SFUMZ15R61	Washer	(1)
N18	SFXWB63M52	Washer	(2)
N19	SFXWB63M53	Washer	(3)
ACCESSORIES			
A1	SFDHBD2N01	Phono Cord	(1)
A2 [XA] only	SFDLJ02N11E	Ground Wire	(1)
A3 [EK] ⚠	SFDAC05G02	AC Cord	(1)
A3 [XL] ⚠	SFDAC05L01	AC Cord	(1)
A3 [XA] ⚠	SFDAC05X02	AC Cord	(1)

Ref. No.	Part No.	Description	
ACCESSORIES			
A3 ⚠ [other]	SFDAC05E02	AC Cord	(1)
A4	SFWE212—01	45 Adaptor	(1)
A5 [EK]	SFNUDD3G01	Instruction Book	(1)
A5 [EG]	SFNUDD3R01	Instruction Book	(1)
A5 [EF]	SFNUDD3F01	Instruction Book	(1)
A5 [Ei]	SFNUDD3I01	Instruction Book	(1)
A5 [XL, XA]	SFNUDD3X01	Instruction Book	(1)
A5 [other]	SFNUDD3S01	Instruction Book	(1)
A6 ⚠ [XA] only	SFDKI19118	Plug	(1)
PACKING PARTS			
P1 [EF] ○	SFHPDD3C01	Carton Box	(1)
P1 ○ [other]	SFHPDD3M01	Carton Box	(1)
P1 [EF] Ⓚ	SFHPDD3F21	Carton Box	(1)
P1 Ⓚ [other]	SFHPDD3M21	Carton Box	(1)
P2	SFHHBD3N01	Pad, Left	(1)
P3	SFHHBD3N02	Pad, Right	(1)
P4	SFHZBD2N01	Pad, Tonearm Weight	(1)
P5	SFHZZ15R02	Clamper, Cord	(1)
P6	SFHZB63M01	Clamper, Tonearm	(2)
P7	SFHKQ63M01	Clamper, Turntable Platter	(2)
P8	SFYH60X60	Polyethylene Bag, Unit	(1)
P9	SFYH52X50	Polyethylene Bag, Dust Cover	(1)
P10	SFYH17X16	Polyethylene Bag, Cord	(1)
P11	SFYF32A35	Polyethylene Bag, Turntable mat	(1)
P12	SFHDBD2N01	Pad, Turntable Mat	(1)
P13	SFYP75A41	Sheet	(1)

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ORDER NO. HAD85042530C1
A2

Service Manual

Direct Drive
Automatic Turntable System

Turntable System
SL-D93U

Color

(K)...Black Type

Area

[M]... U.S.A.

System
SC-A240E

is the standard mark for the "P—mount" plug-in-connector system. Products carrying this mark are interchangeable and compatible with each other.

SPECIFICATIONS

■ TURNTABLE SECTION

Type:	Automatic turntable
Features:	Auto-start, Auto-return Auto-stop
Drive method:	Direct drive
Motor:	Brushless DC motor
Turntable platter:	Aluminum die-cast Diameter 31.2 cm (12-9/32")
Turntable speeds:	33-1/3 rpm and 45 rpm
Wow and flutter:	0.012% WRMS* 0.025% WRMS (JIS C5521) ± 0.035% peak (IEC 98A weighted)

* This rating refers to turntable assembly alone, excluding effects of record, catrridge or tonearm, but including platter. Measured by obtaining signal from built-in frequency generator of motor assembly.

Rumble:	–56 dB (IEC 98A unweighted) –78 dB (IEC 98A weighted)

■ TONEARM SECTION

Type:	Static-balanced straight tonearm Plug-in connector cartridge system
Overhang:	15 mm (19/32")
Effective length:	230 mm (9-1/16")
Tracking error angle:	Within 2°32′ at outer groove of 30 cm (12") disc. Within 0°32′ at inner groove of 30 cm (12") disc.
Effective mass:	13.5 g (including cartridge)
Stylus pressure:	1.25 g (Fixed)
Applicable cartridge weight:	6 g
Phono cable capacitance:	90 pF

■ CARTRIDGE SECTION

Type:	Cartridge model number EPC—P33S Moving magnet stereo cartridge One-point suspension system All laminated core
Frequency response:	10 Hz to 40 kHz
Output voltage:	2.5 mV at 1 kHz 5 cm/s. zero to peak lateral velocity [7 mV at 1 kHz 10 cm/s. zero to peak 45° velocity (DIN 45 500)]
Channel separation:	22 dB at 1 kHz
Channel balance:	Within 2 dB at 1 kHz
Compliance (dynamic):	12×10^{-6} cm/dyne at 100 Hz
Stylus pressure:	1.25 ± 0.25 g (12.5 ± 2.5 mN)
Load impedance:	47 kΩ to 100 kΩ
Weight:	6 g (cartridge only)
Replacement stylus:	EPS—33CS

■ GENERAL

Power supply:	AC 120V, 60 Hz
Power consumption:	4 W
Dimensions (W x H x D):	430 x 96 x 375 mm (16-15/16" x 3-25/32" x 14-3/4")
Weight:	3.9 kg (8.6 lb.)

Specifications are subject to change without notice for further improvement.
Weight and dimensions shown are approximate.

Technics

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50 Meadowland Parkway,
Secaucus. New Jersey 07094

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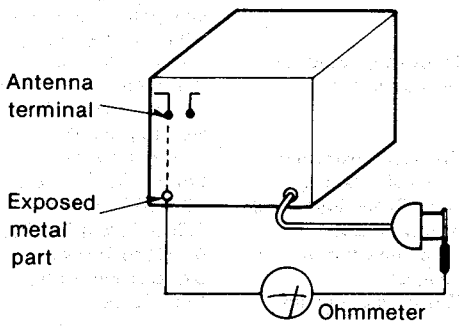
■ SAFETY PRECAUTION

1. Before servicing, unplug the power cord to prevent an electric shock.
2. When replacing parts, use only manufacturer's recommended components for safety.
3. Check the condition of the power cord. Replace if wear or damage is evident.
4. After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc.
5. Before returning the serviced equipment to the customer, be sure to make the following insulation resistance test to prevent the customer from being exposed to a shock hazard.

• INSULATION RESISTANCE TEST

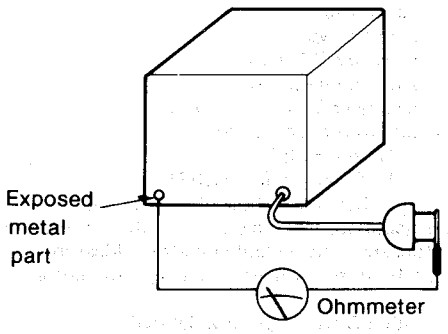
1. Unplug the power cord and short the two prongs of the plug with a jumper wire.
2. Turn on the power switch.
3. Measure the resistance value with ohmmeter between the jumpered AC plug and each exposed metal cabinet part, such as screwheads antenna, control shafts, handle brackets, etc. Equipment with antenna terminals should read between 3MΩ and 5.2MΩ to all exposed parts. (Fig. A) Equipment without antenna terminals should read approximately infinity to all exposed parts. (Fig. B)

Note: Some exposed parts may be isolated from the chassis by design. These will read infinity.



(Fig. A)

Resistance = 3MΩ—5.2MΩ

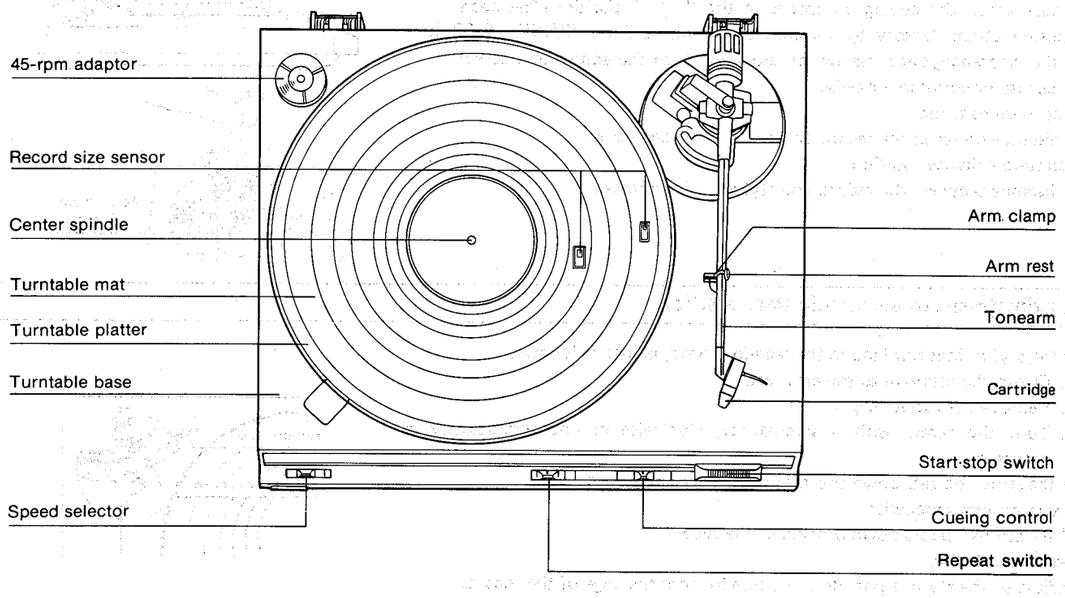


(Fig. B)

Resistance = Approx ∞

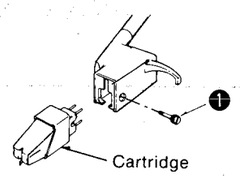
4. If the measurement is outside the specified limits, there is a possibility of a shock hazard. The equipment should be repaired and rechecked before it is returned to the customer.

■ LOCATION OF CONTROLS

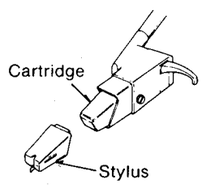


■ DISASSEMBLY INSTRUCTIONS

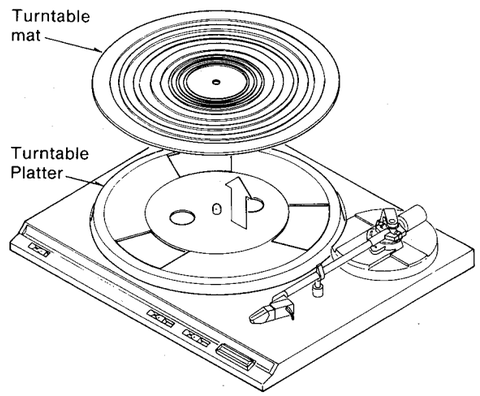
Ref. No 1	How to remove the cartridge
Procedure 1	1. Remove the setscrew ❶. 2. Pull out the cartridge, taking care that your hand does not touch the stylus tip.



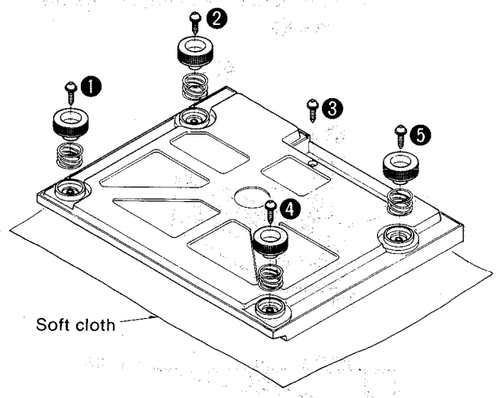
Ref. No 2	How to remove the stylus
Procedure 2	• Pull out the stylus, taking care not to touch the stylus tip.



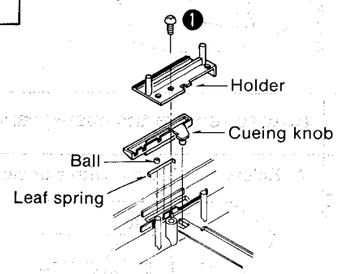
Ref. No 3	How to remove the turntable platter
Procedure 3	1. Remove the turntable mat. 2. Lift up the turntable platter.



Ref. No 4	How to remove the bottom board
Procedure 3 ➧ 4	1. Turn over the unit on a soft cloth. 2. Remove the 5 setscrews (❶~❺)

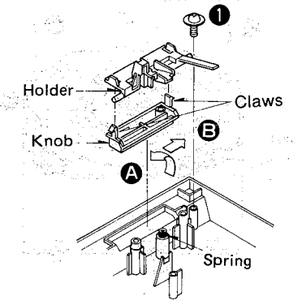


Ref. No 5	How to remove the cueing knob
Procedure 3 ➧ 4 ➧ 5	• Remove the setscrew ❶



Caution:
When removing the cueing knob, please note the ball bearing which is held between the leaf spring and knob and take care not to drop or lose it.

Ref. No 6	How to remove the stop knob
Procedure 3 ➧ 4 ➧ 6	1. Remove the setscrew ❶. 2. Remove the holder (with knob) in the direction of the arrows (Ⓐ, Ⓑ). 3. Release the 2 claws.



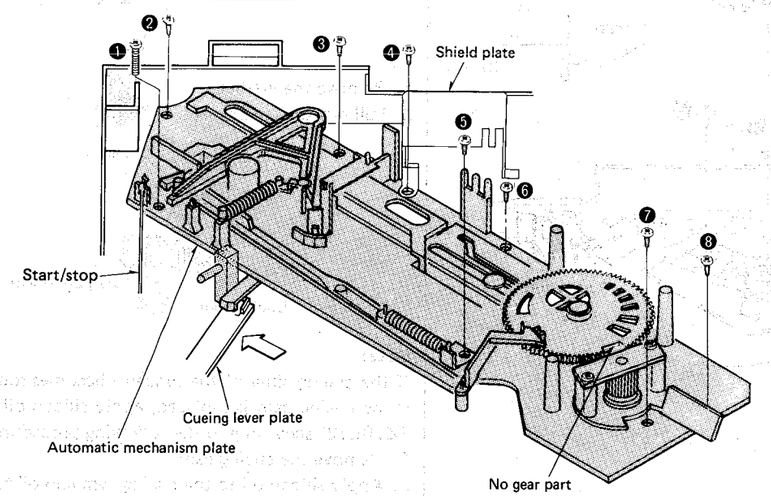
Note: When attaching the stop knob, do not for get to attach the spring.

Ref. No. 7	How to remove the automatic mechanism plate
Procedure 3 ➧ 4 ➧ 7	

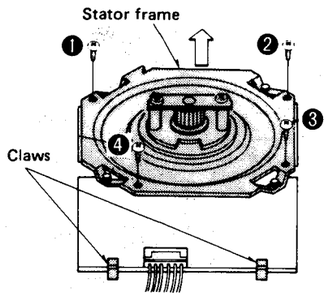
1. Move the cueing control knob to "cueing down" position.
2. Release the start/stop rod.
3. Remove the 8 setscrews. (❶~❽).
4. Lift up the automatic mechanism plate.

Note:
When fitting the automatic mechanism plate, check the following points.

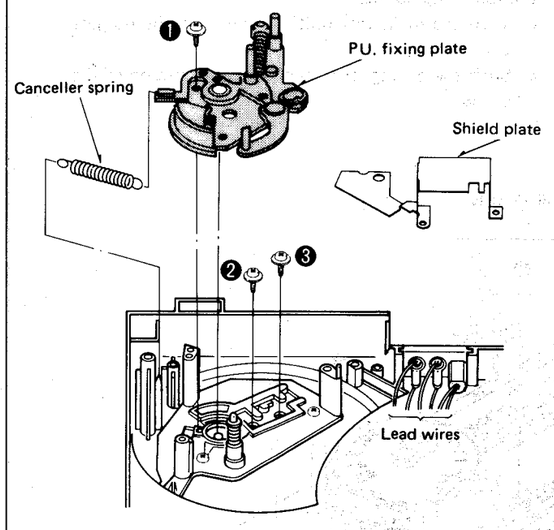
- Turn the main gear unitil it comes to the no gear part.
- Shift the cueing lever plate in the direction of the arrow.



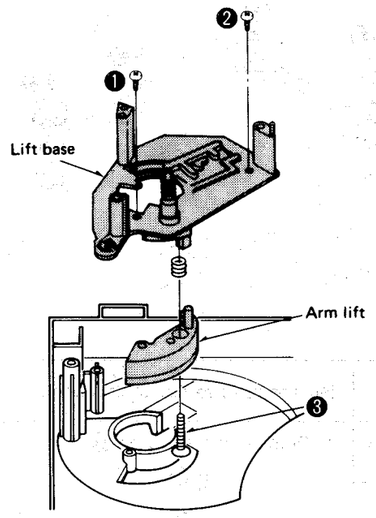
Ref. No. 8	How to remove the stator frame
Procedure 3 ➧ 4 ➧ 7 ➧ 8	1. Remove the 4 setscrews. (❶ ~ ❹). 2. Remove the stator frame from the 2 claws in the direction of the arrow.



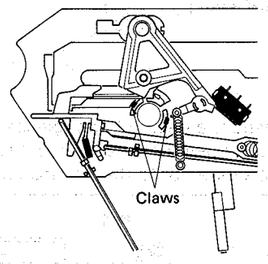
Ref. No. 9	How to remove the tonearm
Procedure 3 ➧ 4 ➧ 7 ➧ 9	1. Remove the PU fixing plate setscrew ❶. 2. Remove the shield plate. 3. Unsolder the 5 lead wires of the phono terminal. 4. Remove the 2 setscrews. (❷, ❸). ★ PU lead wiring method. White . . . . . .L channel (+) terminal Blue . . . . . .L channel (—) terminal Red . . . . . .R channel (+) terminal Green . . . . . .R channel (—) terminal Black . . . . . .Ground terminal



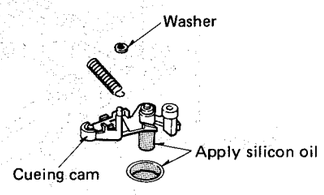
Ref. No. 10	How to remove the lift base and lift
Procedure 3 ➧ 4 ➧ 7 ➧ 9 ➧ 10	1. Remove the 2 setscrews. (❶, ❷). Then the lift base can be removed. 2. To remove the arm lift, remove the screw ❸.



Ref. No. 11	How to remove the cueing cam
Procedure 3 ➧ 4 ➧ 7 ➧ 11	● Release the 2 claws with a driver.



1. Remove the washer.
2. Pull out the cueing cam.

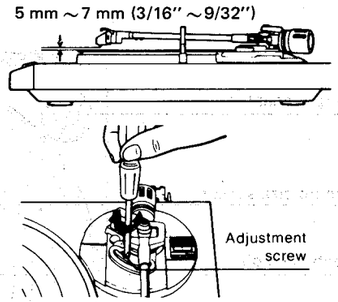


Note:
If the cueing time of the tonearm becomes too short, or if the cueing cam is replaced, apply silicon oil (Part No. SZZ0L12) according to the following procedure.
1. Remove the cueing cam.
2. Apply silicon oil to the cueing cam and oil tank.

■ MEASUREMENTS AND ADJUSTMENT

1. Arm-lift height

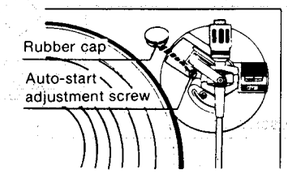
The arm-lift height (distance between the stylus tip and the record surface when the cueing control is at the " ▼ " position) has been adjusted at the factory to aproximately 5 mm to 7 mm (3/16" ~ 9/32"). If the clearance is too narrow or too wide, turn the adjustment screw clockwise or counterclockwise.
Clockwise rotation
– distance between the record and stylus tip is decreased.
Counterclockwise rotation
– distance between the record and stylus tip is increased.



2. Adjustment of automatic start position

If the stylus does not land in the lead-in groove, adjust as follows.
1. Clamp the tonearm to the arm rest.
2. Remove the rubber cap.
3. Turn the screw with a screwdriver, clockwise or counterclockwise as necessary.

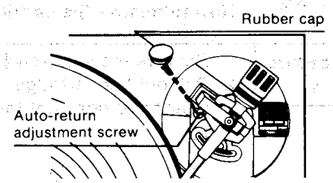
If the stylus tip sets down too far in the recorded groove.
–turn counterclockwise.
If the stylus tip sets down outside of the record.
–turn clockwise.
Adjust so the stylus tip lands 1 ~ 2 mm in from the edge of the record.



3. Automatic return position

(Remove the rubber cap.)
1. Put the stylus protector on the cartridge.
2. Move the tonearm toward the center of the record.
   The auto-return adjustment screw will appear.

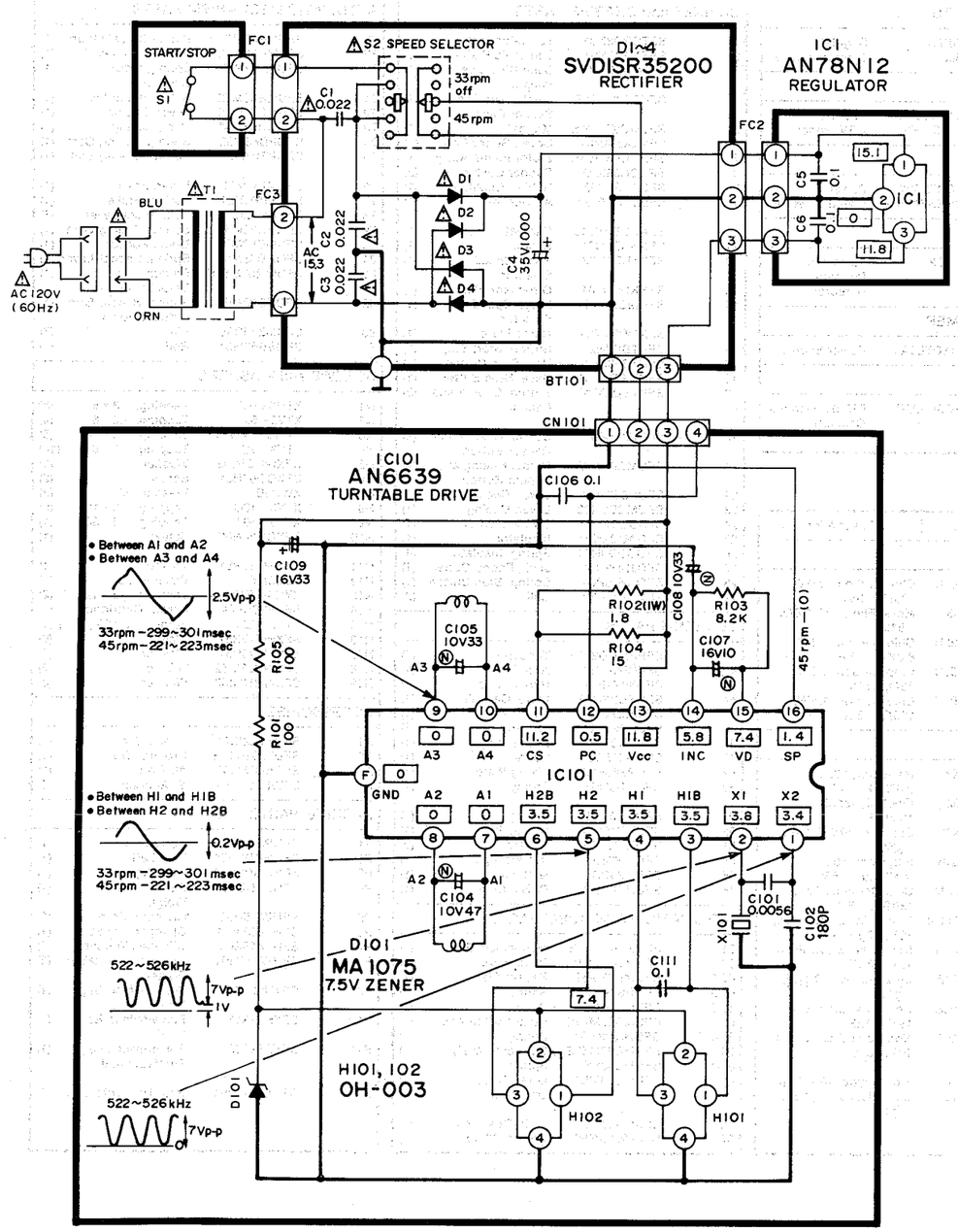
If the tonearm tends to return to the arm reset before the play has finished.
– turn counterclockwise.
If the tonearm fails to return after the final groove.
– turn clockwise.



■ SCHEMATIC DIAGRAM

(This schematic diagram may be modified at any time with development of new technology.)

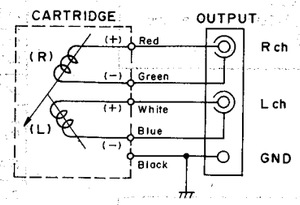
Notes: 1. **S1** : On/off (power) switch in "**on**" position.
2. **S2** : Speed selector switch in "**off**" position.
3. The voltage value, and waveforms are the reference voltage values of this unit measured by DC electronic voltmeter (high impedance) and oscilloscope on the basis of chassis the unit is in play.
4. Important safety notice:
Components identifier by ⚠ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.

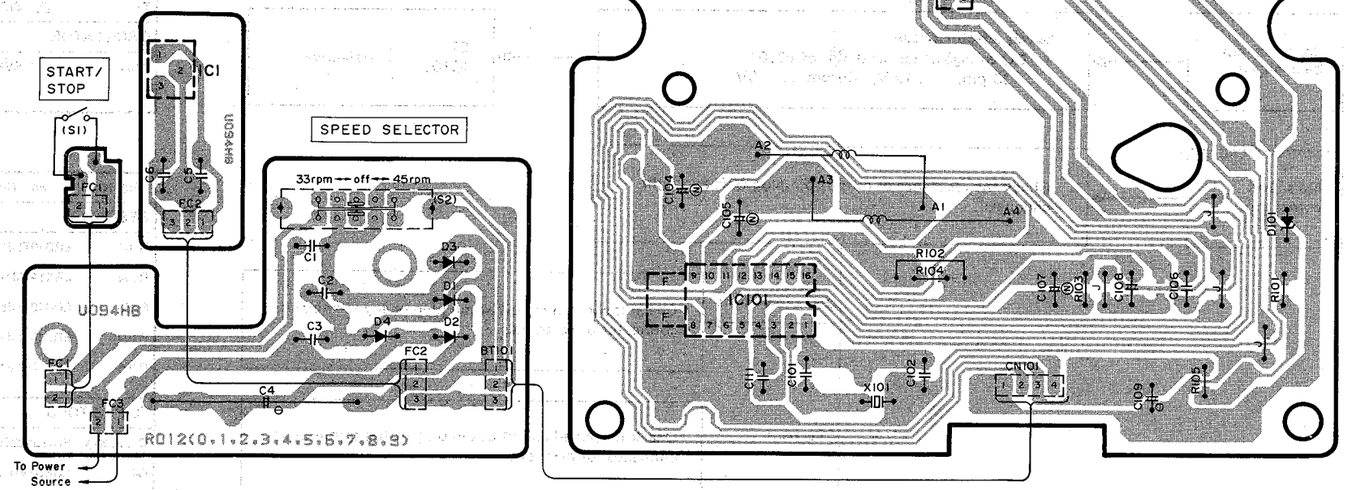


■ CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM

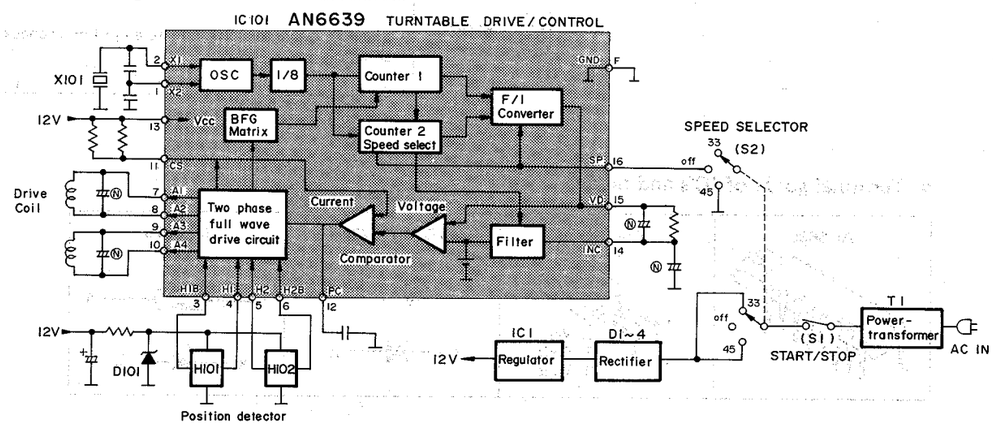
★ Caution !

IC and LSI are sensitive to static electricity.
Secondary trouble can be prevented by taking care during repair.
★ Cover the parts boxes made of plastics with aluminum foil.
★ Ground the soldering iron.
★ Put a conductive mat on the work table.
★ Do not touch the legs of IC or LSI with the fingers directly.





• Block diagram



■ TROUBLE SHOOTING

Turntable does not rotate

Power source circuit
1. AC 15.3V between FC3 terminals ① and ②.
2. DC voltage of regulator IC (IC1).
   ① 15.1V ② 0V ③ 11.8V

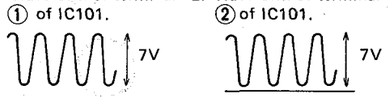
→ T1, S1, S2, D1 ~ D4, IC1, IC101 } defective

Drive coil and Hall element
1. Conduction check of drive coils (A1 ~ A4).
2. DC voltage of Hall elements (H101, H102).
   ① 3.5V ② 7.4V ③ 3.5V ④ 0V

→ Drive coil, H101, H102, IC101 } defective

Unstable rotation

Oscillator circuit
1. Waveform of terminal ① of IC101.
2. Waveform of terminal ② of IC101.



→ X101, IC101, C101, C102 } defective

Speed cannot be changed

Speed selector circuit
1. DC voltage of terminal ⑯ of IC101.
   33rpm. . . . . 1.4V, 45rpm. 0V

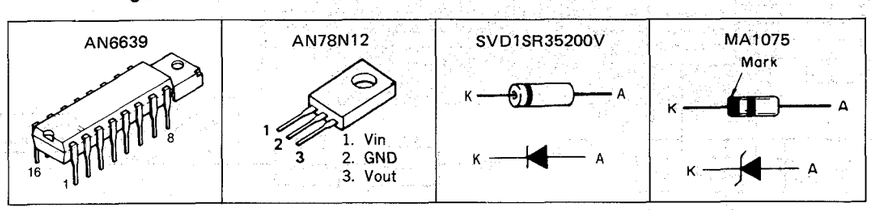
→ S2, IC101 } defective

No sound comes out.

Check the resistance at output pin plug (left and right channels).

- 0 ~ a few ohms → Check if shorted circuit at pin plug or lug terminal or connector or cartridge.
- ∞ (open) → Check if opened circuit at pin plug or lug terminal or connector or cartridge.
- 500 ~ 600Ω → Check if sequently connected to amplifier or check amplifier.

• Terminal guide of IC's and diodes



■ REPLACEMENT PARTS LIST

Notes: 1. Part numbers are indicated on most mechanical parts. Please use this part number for parts order.
2. Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
3. The parenthesized numbers in the column of description stand for the quantity per set.

Ref. No.	Part No.	Description
INTEGRATED CIRCUITS		
IC1	AN78N12	Regulator
IC101	AN6639	Turntable Drive
DIODES		
D1~4	⚠ SVD1SR35200V	Rectifier
D101	MA1075-FV	7.5V, Zener
SWITCHES		
S1	⚠ SFDSD72R01	Power
S2	⚠ SFDSHSW0949	Speed Selector
HALL ELEMENTS		
H101, 102	0H-002	Turntable Position Detector
POWER TRANSFORMER		
T1	⚠ SLT48DTL3A	Power Source
OSCILLATOR		
X101	SVFCSB525P	525kHz Ceramic Oscillator

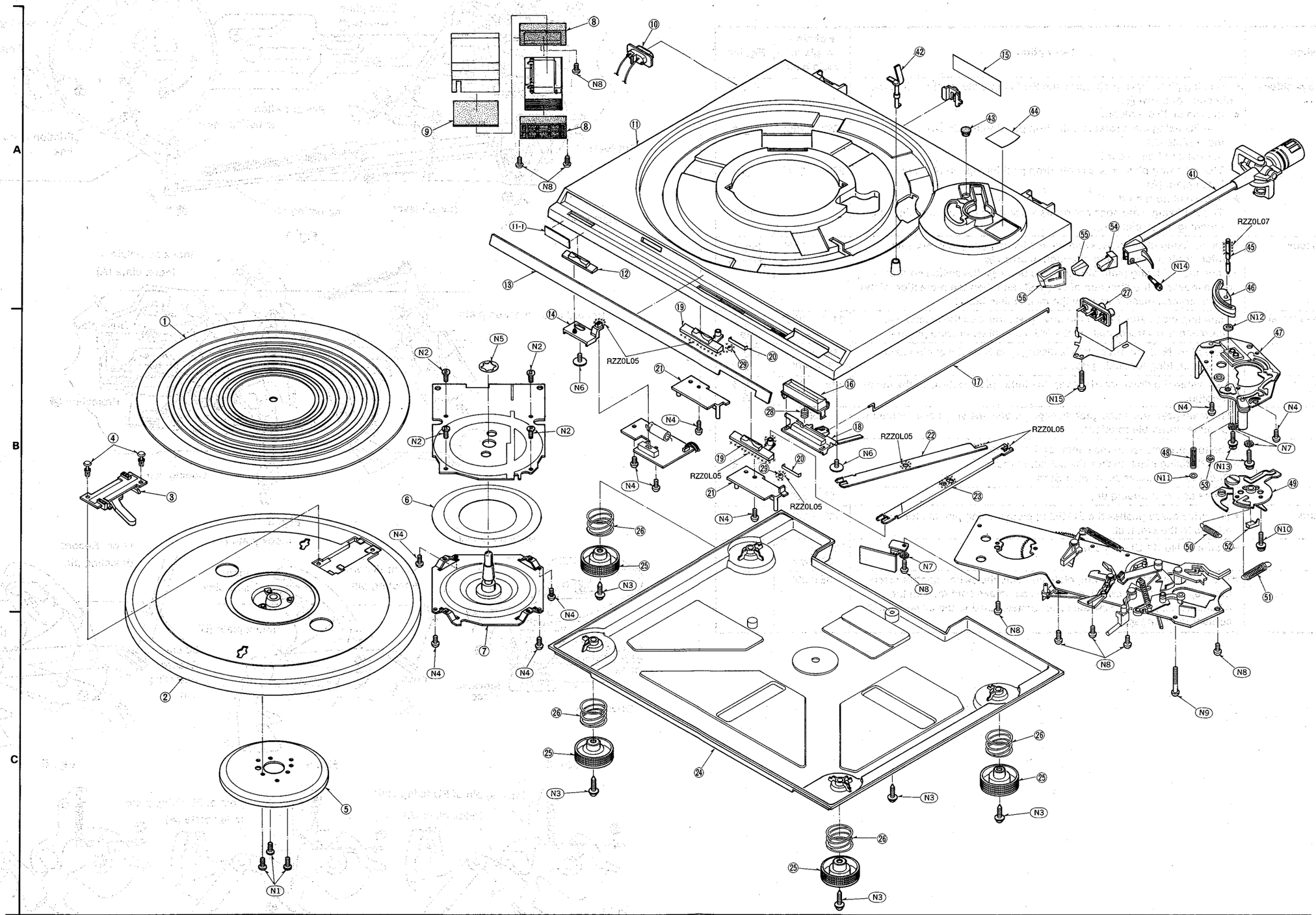
Ref. No.	Part No.	Description
RESISTORS		
R101	ERD10TLJ101U	Chip Carbon, 1/8W, 100Ω, ±5%
R102	ERX1ANJ1R8	Metal Film, 1W, 1.8Ω, ±5%
R103	ERD10TLJ822U	Chip Carbon, 1/8W, 8.2KΩ, ±5%
R104	ERD10TLJ150U	Chip Carbon, 1/8W, 15Ω, ±5%
R105	ERD10TLJ101U	Chip Carbon, 1/8W, 100Ω, ±5%
CAPACITORS		
C1, 2, 3⚠	ECQG1223KZ	Polyester, 100V, 0.022μF, ±10%
C4	ECEB1VU102	Electrolytic, 35V, 1000μF
C5, 6	ECFR1H104ZF	Ceramic, 50V, 0.1μF, +80% -20%
C101	ECQM1H562JV	Polyester, 50V, 0.0056μF, ±5%
C102	ECUV1H181JCM	Chip Ceramic, 50V, 180PF, ±5%
C104	ECEA1AN470SB	Non Polar Electrolytic, 10V, 47μF
C105	ECEA1AN330S	Non Polar Electrolytic, 10V, 33μF
C106	ECFR1H104ZF	Ceramic, 50V, 0.1μF, +80% -20%
C107	ECEA1CN100S	Non Polar Electrolytic, 16V, 10μF
C108	ECEA1AN330S	Non Polar Electrolytic, 10V, 33μF
C109	ECEA1CU330	Electrolytic, 16V, 33μF
C111	ECFR1H104ZF	Ceramic, 50V, 0.1μF, +80% -20%

Ref. No.	Part No.	Description	
CABINET and CHASSIS PARTS			
1	SFTGBD3N01	Turntable Mat	(1)
2	SFTEDD3N01	Turntable Platter	(1)
3	SFUMQ34N01E	Base Disc Size Sensor	(1)
4	SFUZD33-01E	Latch, Disc Size Sensor Base	(2)
5	SFTMC07-01E	Magnet	(1)
6	SFMGQ34N01	Cover, Stator Coil	(1)
7	SFMZQ63M53A	Stator Flame Ass'y	(1)
8	SFGCC05N02	Rubber Cushion	(2)
9	SFGZC05N03	Rubber Cushion	(1)
10	⚠ SFDJHSC0491	AC Socket	(1)
11	SFACDD3N21E	Cabinet	(1)
11-1	SFKBBD2N21	Badge	(1)
12	SFKTBD2N23	Knob, Speed Selector	(1)
13	SFKKD93M01	Ornament Plate	(1)
14	SFUMQD3N01	Lever, Speed Selector	(1)
15	SFNND94M01	Name Plate	(1)
16	SFKTBD2N21	Button, Start Stop	(1)
17	SFUZB63M01	Rod, Stop Button	(1)
18	SFUMBD3N01	Base, Stop Button	(1)
19	SFKTBD2N22	Button, Cueing and Repeat	(2)
20	SFQPZ15R02	Spring, Cueing and Repeat Button	(2)
21	SFUMBD3N02	Guide, Cueing and Repeat Button	(2)
22	SFUPB63M01	Lever, Repeat (1)	(1)
23	SFUMBD2N03	Lever, Cueing	(1)
24	SFAUBD2N01	Bottom, Cover	(1)
25	SFGABD2N01	Insulator	(4)
26	SFQCQD3N01	Spring, Insulator	(4)
27	SFDJBD2N01	Jack, Phono Outlet	(1)
28	SFQHZ15R01	Spring, Stop Button	(1)
29	SFYB-5-32	Ball	(2)
TONEARM PARTS			
41	SFPAMDD202A	Tonearm	(1)
42	SFKUMA1N01E	Arm Rest	(1)
43	SFGK171F01	Rubber Cap	(1)
44	SFKKBD2N02	Plate, Canceller	(1)
45	SFXJBD2N51	Lift Shaft	(1)
46	SFUMBD2N51	Lift Arm	(1)
47	SFUPBD3N51E	Arm Base	(1)
48	SFQAZ15R53	Spring	(1)
49	SFUPB63M52E	Fixing Plate	(1)
50	SFQHB63M57	Spring	(1)
51	SFQHB63M56	Spring	(1)
52	SFUMZ15R57	Spring Pin	(1)
53	SFGZZ15R02	Holder	(2)
54	EPC-P33S	★ Cartridge	(1)
55	EPS-33CS	★ Stylus	(1)
56	SFCNC03301	Cover, Stylus	(1)
AUTOMATIC MECHANISM PARTS			
61	SFUKB63M52E	Mechanism Plate	(1)
62	SFUBB63M51E	Drive Plate	(1)
62-1	SFUMB63M52	Repeat Plate	(1)
62-2	SFQPB63M51	Spring	(1)
62-3	SFUMB63M51	Plate	(1)
63	SFUMB63M71E	Lever Switch Ass'y	(1)
63-1	SFQHQD3N01	Spring	(1)
64	SFUMB63M53E	Cut Lever Ass'y	(1)
64-1	SFQHB63M51	Spring	(1)
65	SFUMB63M54	Lever, Drive Operation	(1)
66	SFUGB63M51E	Main Gear Ass'y	(1)
67	SFUMB63M65	Control Plate	(1)

Ref. No.	Part No.	Description	
AUTOMATIC MECHANISM PARTS			
68	SFUMB63M64E	Plate (B) Ass'y Index	(1)
69	SFUMB63M63	Plate (A), Index	(1)
70	SFQPB63M53	Spring, Index Sub Plate	(1)
71	SFUMB63M62	Sub Plate, Index	(1)
72	SFUMB63M59	Lever, Cueing	(1)
73	SFUMB63M60	Cam, Cueing	(1)
74	SFQPB63M52	Spring, Cueing Cam	(1)
75	SFQPB63M54	Spring, Cueing Cam	(1)
76	SFUMB63M61	Lever, Brake	(1)
77	SFQSB63M52	Spring, Brake	(1)
78	SFUZB63M52	Felt, Brake Lever	(1)
79	SFQHB63M55	Spring, Cueing Cam	(1)
80	SFUMB63M58	Lever, Repeat	(1)
81	SFQHB63M54	Spring, Repeat Lever	(1)
82	SFUMQ63M51E	Record Size Detector Ass'y	(1)
82-1	SFQHB63M53	Spring, Record Size Detector Ass'y	(1)
83	SFUMZ15R56	Pin	(7)
84	SFQSB63M51	Rod	(1)
SCREWS and WASHERS			
N1	XTN3+6J	Tapping, ⊕3×6	(3)
N2	XTV3+6J	Tapping, ⊕3×6	(4)
N3	XTW3+14QFYR	Tapping, ⊕3×14	(5)
N4	XTV3+8G	Tapping, ⊕3×8	(10)
N5	SFXWC06N02	Washer	(1)
N6	SFXGQ06N01	Screw	(2)
N7	XWC3B	Washer, φ3	(3)
N8	XTV3+10G	Tapping, ⊕3×10	(9)
N9	XTV3+30J	Tapping, ⊕3×30	(1)
N10	SFXGQ34N02	Screw	(1)
N11	SFXWZ15R51	Washer	(1)
N12	XUC3FY	Washer, φ3	(1)
N13	XYN3+F12	Tapping, ⊕3×12	(2)
N14	SFPEV0Q601	Screw, Cartridge	(1)
N15	XTV3+20J	Screw, ⊕3×20	(1)
N16	SFXWZ15R51	Washer	(9)
N17	SFUMZ15R61	Washer	(1)
N18	SFXWB63M52	Washer	(2)
N19	SFXWB63M53	Washer	(3)
ACCESSORIES			
A1	SFDHBD2N01	Phono Cord	(1)
A2	SFDLJ02N11E	Ground Wire	(1)
A3	⚠ SFDAC05M02	AC Cord	(1)
A4	SFWE212-01	45 Adaptor	(1)
PACKING PARTS			
P1	SFHPD94M01	Carton Box	(1)
P2	SFHHBD3N01	Pad, Left	(1)
P3	SFHHBD3N02	Pad, Right	(1)
P4	SFHZBD2N01	Pad, Tonearm Weight	(1)
P5	SFHZZ15R02	Clamper, Cord	(1)
P6	SFHZB63M01	Clamper, Tonearm	(1)
P7	SFHZZ15R03	Clamper, Tonearm	(1)
P8	SFHKQ63M01	Clamper, Turntable Platter	(2)
P9	SFYH60X60	Polyethylene Bag, Unit	(1)
P10	SFYH17X16	Polyethylene Bag, Cord	(1)
P11	SFYF32A35	Polyethylene Bag, Turntable mat	(1)
P12	SFHDBD2N01	Pad, Turntable Mat	(1)

■ EXPLODED VIEW

- **Cabinet and chassis parts**



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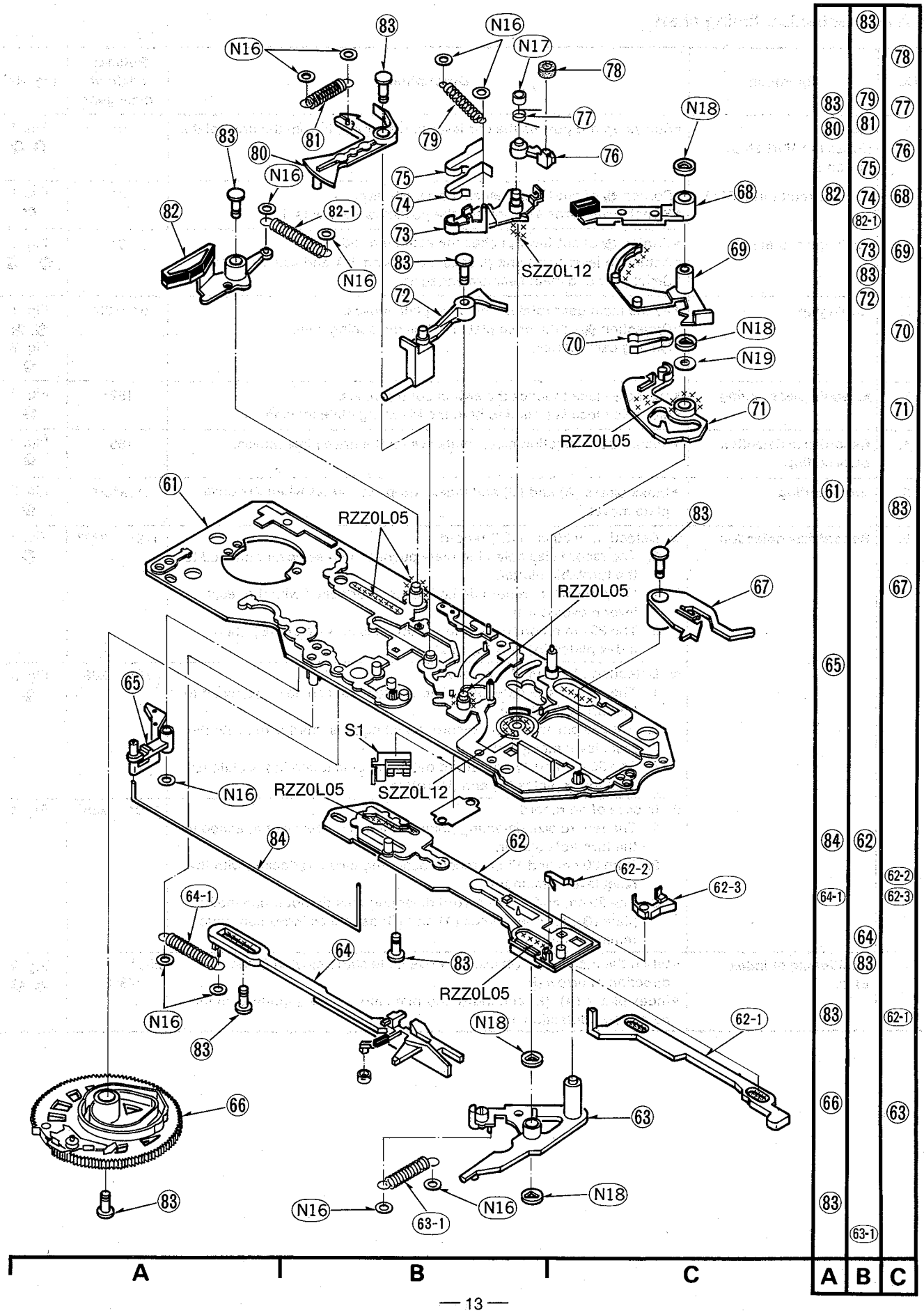
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N18
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■ OPERATIONAL DESCRIPTION OF MECHANISM

• Auto mechanism timing chart

No.	Operation	Description	Rotation angle of main gear	Fig. No.
1.	**Start** (Press the start/stop button.)	•Start/stop rod pushes the cut-lever to disengage it from the drive plate.	0°	Fig. 1 ❶, ❷
	(Drive circuit turns ON.)	•Portion Ⓐ of cut-lever pushes the switch lever. •Switch lever turns and presses the power switch contact.	0°	Fig. 1 ❸
	(Main gear rotates.)	•Portion Ⓑ of cut-lever pushes the actuating rod. •Actuating lever turns and pushes the friction link and actuating link. •Small gear and main gear are engaged.	0°	Fig. 1 ❹ ~ ❼
2.	**Cueing up**	•As the main gear rotates, the drive plate moves. •Projection Ⓒ of the drive plate pushes the cueing cam. •Cueing cam rotates.	6° ~ 33°	Fig. 1 ❽, ❾ Fig. 2 ❿
3.	**Movable piece setting**	•Movable piece touches the switch control piece. •Movable piece is turned to hold the PU fixing plate moving pin.	152°	Fig. 3 ⓫
4.	**Record size detection plate setting**	•Record size detection plate rotates when the drive plate moves.	156°	Fig. 2 ⓬
5.	**Index setting**	•Index plates (A) and (B) and index sub-plate rotates when the drive plate moves.	158°30′	Fig. 2 ⓭
6.	**Record size detection**	★ Detection of 30 cm (12") record 1. The record size detecting plate pushes the reset lever attached to the turntable platter. 2. Only the 30 cm record detecting pin interlocked with the reset lever moves down. 3. The 30 cm record detecting pin touches index plate (B), then index plates (A) and (B) rotate.	170° ~ 238°	Fig. 4 ⓮
		★ Detection of 17 cm (7") record 1. The record size detecting plate pushes the reset lever attached to the turntable platter. 2. Both 30 cm and 17 cm record detecting pins interlocked with the reset lever move down. 3. The 30 cm and 17 cm record detecting pins touch index plate (B), then index plates (A) and (B) rotate.	170° ~ 238°	Fig. 5 ⓯
		★ In case of no record 1. The record size detecting plate pushes the reset lever attached to the turntable platter. 2. Both 30 cm and 17 cm record detecting pins interlocked with the reset lever remain up. 3. The 30 cm and 17 cm record detecting pins do not touch index plate (B), so index plates (A) and (B) as well as index sub-plate remain stationary.	170° ~ 238°	Fig. 4
7.	**Positioning of index plate**	•When the main gear rotates, the drive plate starts moving in the direction of arrow ⓰. •Index plates (A), (B) and index sub-plate move back slightly as in the record size detection mode.	255° ~ 278°30′	Fig. 2 ⓰, ⓱

No.	Operation	Description	Rotation angle of main gear	Fig. No.
8.	**Tonearm drop position**	•PU fixing plate moving pin turns the PU fixing plate, pushing it in the direction of arrow ⑱. ★ In case of 30 cm record The PU fixing plate rotates until drop positioning pin (A) contacts index plate (A). ★ In case of 17 cm record The PU fixing plate rotates until drop positioning pin (A) contacts index plate (A). ★ In case of no record The PU fixing plate does not rotate since drop positioning pin (B) is touching index plate (A).	 269° ~ 299° 269° ~ 317° 	Fig. 6 Fig. 6 Fig. 7 Fig. 8
9.	**Power switch lock**	•The PU fixing plate rotates and the PU fixing plate pin pushes the switch control piece in the direction of arrow ⑳. •When the PU fixing plate pin moves to point ㉑, the switch control piece moves in the direction of arrow ㉒, and then the projection of the switch control piece is held by the mechanism board.	269° ~ 299°	Fig. 1 ⑳ ~ ㉒
10.	**Moving piece reversal**	•Actuating piece attached to the drive plate touches the mechanism board and is reversed, making the PU fixing plate moving pin free.	310° ~ 326°	Fig. 3 ㉓
11.	**Cueing down**	•Projection Ⓒ of the drive plate is disengaged from the cueing cam, thereby shifting for cueing down.	336° ~ 354°40′	Fig. 2 ㉔
12.	**Index cancel**	•Also, when the drive board moves, the index plate returns to the initial condition.	340° ~ 360°	Fig. 2 ㉕
13.	**Begin play**	•The main gear and small gear disengage; only the small gear continues to rotate (turntable rotation).	360°	
14.	**End play**	•The tonearm moves to the center of the turntable. •The PU fixing plate pushes the actuating rod. •Operation continues as in No. 1 Start.		Fig. 1 ④ ~ ⑦
15.	**Cueing up**	•(Same as No. 2 Cueing up)	6° ~ 33°	
16.	**Tonearm return**	•The drive board pushes the PU fixing plate moving pin; the tonearm returns to the arm rest.	43° ~ 142°	
17.	**Cueing down**	•(Same as No. 11 Cueing down)	336° ~ 354°40′	
18.	**Power off**	•The fixed pin of the PU fixing plate contacts the switch control piece; the projection of the switch control piece breaks contact with the mechanism board. The switch lever rotates, causing the power switch contact to disengage.	351°30′	

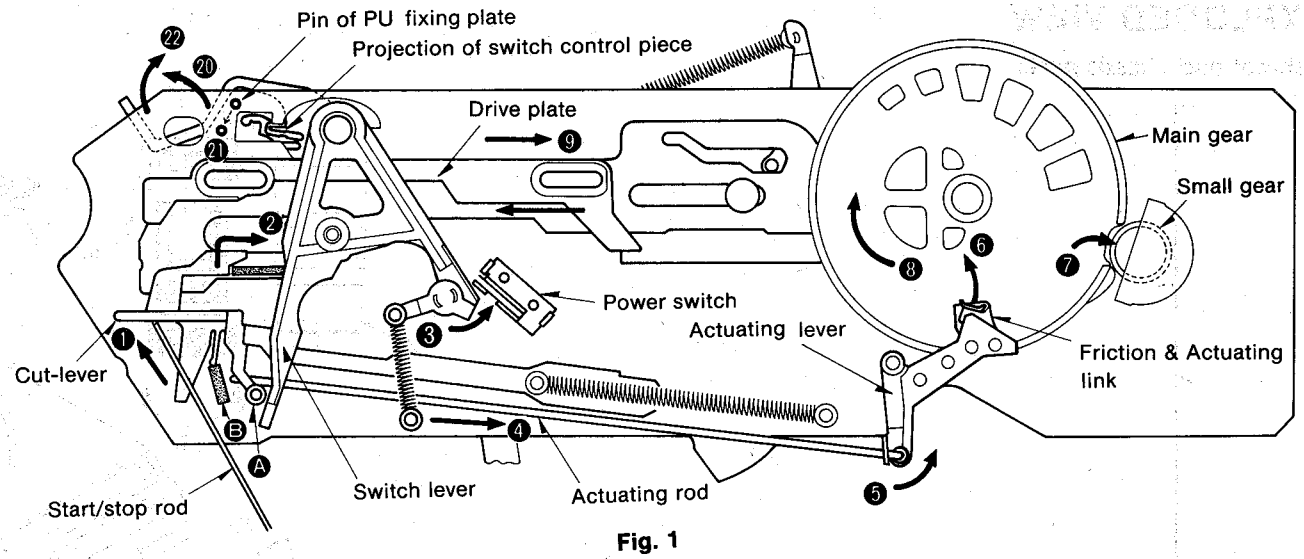

Fig. 1

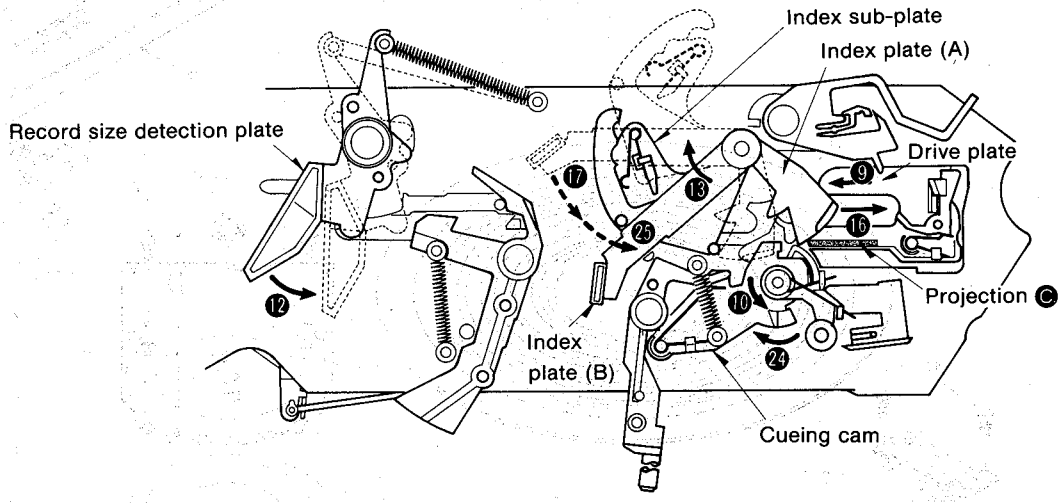

Fig. 2

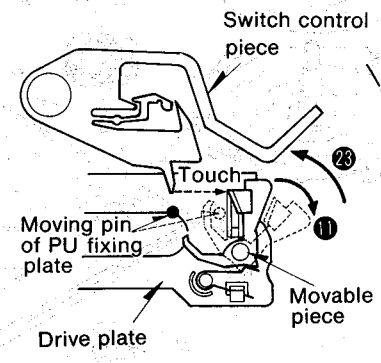

Fig. 3

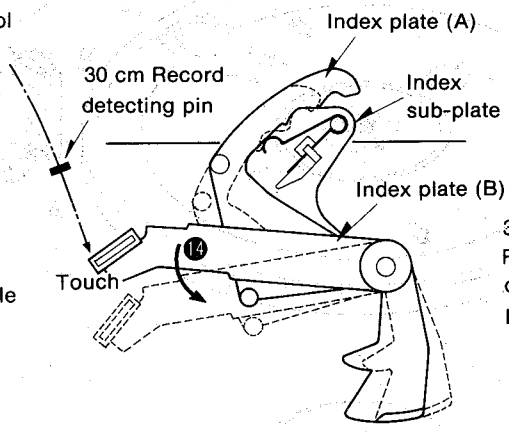

Fig. 4

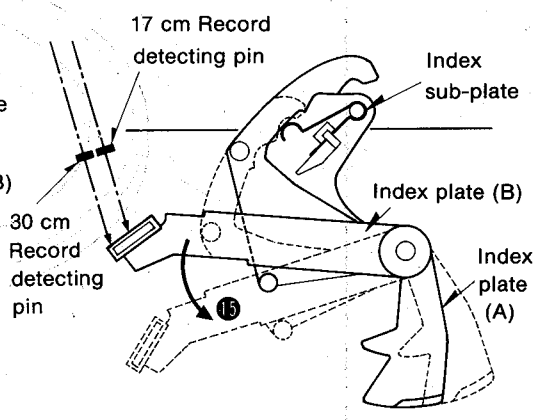

Fig. 5

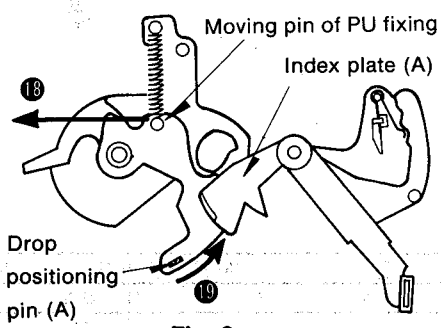

Fig. 6

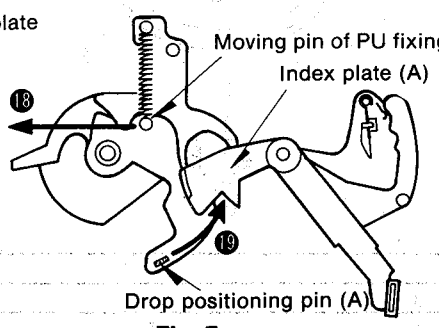

Fig. 7

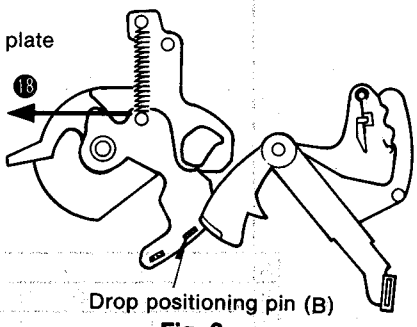

Fig. 8

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